THE INVENTION CLAIMED IS

1. A combustion engine apparatus, comprising:

a first stage piston engine,

fuel,

means for combusting said fuel in said a first stage piston engine in a first stage producing piston engine exhaust gases with said piston engine exhaust gases containing said fuel;

a second stage turbine engine operatively connected to said first stage piston engine,

means for combusting said fuel contained in said piston engine exhaust gases in said second stage turbine engine producing turbine engine exhaust gases; and

means for supercharge said first stage piston engine using said turbine engine exhaust gases.

2. The combustion engine apparatus of claim 1 wherein said piston engine is a diesel engine.

3. The combustion engine apparatus of claim 1 wherein said piston engine is a compression ignition engine, a homogenous charged compression ignition engine, a variable compression engine, a nitrogen enriched air combustion engine, a rotating engine, a linear engine, and/or a reciprocating engine.

4. The combustion engine apparatus of claim 1 wherein said means for combusting said fuel contained in said piston engine exhaust gases in said second stage turbine engine includes compressor means for providing compressed air to said second stage turbine engine for combusting said fuel contained in said piston engine exhaust gases.

5. The combustion engine apparatus of claim 1 wherein said fuel is oil, methane, natural gas, ammonia, alcohols and/or ethers.

6. The combustion engine apparatus of claim 1 wherein said fuel is any combustible matter including fossil fuels inorganic fuels and/or organic fuels.

7. The combustion engine apparatus of claim 1 wherein said fuel is any combustible matter including oil, natural gas, coal, and/or inorganic fuels including ammonia, hydrazine, calcium, and/or organic fuels including alcohols, ethers, wood.

8. A combustion engine apparatus, comprising:

fuel,

a first stage piston engine for combusting said fuel in a first stage, said first stage piston engine producing piston engine exhaust gases with said piston engine exhaust gases containing said fuel;

a second stage turbine engine for combusting said fuel contained in said piston engine exhaust gases in a second stage, said second stage turbine engine producing turbine engine exhaust gases; and

a supercharger for supercharge said piston engine using said turbine engine exhaust gases.

9. The combustion engine apparatus of claim 8 wherein said first stage piston engine is a compression ignition engine, a homogenous charged compression ignition engine, a variable compression engine, a nitrogen enriched air combustion engine, a rotating engine, a linear engine, and/or a reciprocating engine.

10. The combustion engine apparatus of claim 8 including a compressor for providing compressed air to said second stage turbine engine for combusting said fuel contained in said piston engine exhaust gases.

11. The combustion engine apparatus of claim 8 wherein said fuel is oil, methane, natural gas, ammonia, alcohols and/or ethers.

12. The combustion engine apparatus of claim 8 wherein said fuel is any combustible matter.

13. The combustion engine apparatus of claim 12 wherein said any combustible matter comprises fossil fuels including oil, natural gas, and/or coal.

14. The combustion engine apparatus of claim 12 wherein said any combustible matter comprises inorganic fuels including ammonia, hydrazine, and/or calcium.

15. The combustion engine apparatus of claim 8 wherein said any combustible matter comprises organic fuels including alcohols, ethers, and/or wood.

16. A combustion engine method that provides increased fuel efficiency and reduces polluting exhaust emissions by burning fuel in two stages, comprising the steps of:

combusting said fuel in a piston engine in a first stage, said step of combusting said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said fuel;

combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine producing turbine engine exhaust gases; and

using said turbine engine exhaust gases to supercharge said piston engine.

17. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage comprises combusting said fuel in a compression ignition engine.

18. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage comprises combusting said fuel in a homogenous charged compression ignition engine.

19. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage comprises combusting said fuel in a variable compression engine.

20. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage comprises combusting said fuel in a nitrogen enriched air combustion engine.

21. The combustion engine method of claim 16 including the step of operating said piston engine fuel rich thereby producing a reducing atmosphere and suppressing the formation of NOx.

22. The combustion engine method of claim 16 including the steps of burning most of said fuel is in said the piston engine and maintaining said piston engine exhaust gases sufficiently fuel rich for a second burn in said turbine engine.

23. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage comprises combusting said fuel in a compression ignition engine that has heterogeneous combustion resulting in said fuel in said piston engine exhaust gases being at stoichiometric conditions.

24. The combustion engine method of claim 16 wherein said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine occurs at or near stoichiometric conditions at reduced combustion temperatures where NOx is difficult to form.

25. The combustion engine method of claim 16 wherein said step of using said turbine engine exhaust gases to supercharge said piston engine comprises using said turbine engine exhaust gases to drive a compressor that supercharges said piston engine.

26. The combustion engine method of claim 16 including using said compressor to provides compressed air to said turbine engine for said the step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine.

27. The combustion engine method of claim 16 wherein said piston engine is a compression ignition engine and wherein the residence time of combusting said fuel contained in said piston engine exhaust gases in said turbine engine is increased to ensure that all hydrocarbons and particles are burned.

28. The combustion engine method of claim 16 wherein said piston engine is a compression ignition engine and wherein excess air is added in said turbine engine is increased to ensure that all hydrocarbons and particles are burned.

29. The combustion engine method of claim 16 wherein said piston engine is a spark ignition engine that is operated fuel rich to suppress engine knock.

30. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage is combusted with an oxidizer stream.

31. The combustion engine method of claim 30 wherein said oxidizer stream is nitrogen enriched air.

32. The combustion engine method of claim 16 wherein said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine stage is combusted with an oxidizer stream.

33. The combustion engine method of claim 32 wherein said oxidizer stream is air.

34. The combustion engine method of claim 32 wherein said oxidizer stream is nitrogen enriched air.

35. The combustion engine method of claim 16 wherein said step of combusting said fuel in a piston engine in a first stage and/or said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine stage is combusted with an oxidizer stream.

36. The combustion engine method of claim 16 wherein said fuel is oil, methane, natural gas, ammonia, alcohols and/or ethers.

37. The combustion engine method of claim 16 wherein said fuel is any combustible matter including fossil fuels (oil, natural gas, coal, etc.) inorganic fuels (ammonia, hydrazine, calcium, etc.) and/or organic fuels (alcohols, ethers, wood, etc.).

38. The combustion engine method of claim 16 wherein said steps of combusting takes place to perform work.

39. The combustion engine method of claim 16 wherein said steps of combusting takes place to provide heat.

40. The combustion engine method of claim 39 wherein said heat is used for a furnace.

41. The combustion engine method of claim 39 wherein said heat is used for a boiler.

42. The combustion engine method of claim 39 wherein said heat is used for a smelter.

43. The combustion engine method of claim 39 wherein said heat is used for an Otto engine.

44. The combustion method of claim 16 including the step of providing a bypass valve placed in front of said piston engine to assist starting and acceleration of said piston engine.

45. The combustion method of claim 16 including the step of providing direct fuel injection into said turbine engine to assist starting and acceleration of said piston engine.

46. The combustion method of claim 16 including the step of providing a starter to said turbine engine to start said turbine engine and said piston engine.

47. The combustion method of claim 16 including the step of providing a mixing device between said piston engine exhaust and said turbine engine entrance to make a well-stirred fuel and oxidizer stream into said turbine engine.